

## **Dam, Multiple-Purpose (number and acre-feet)**

### **Definition**

A dam constructed across a stream or a natural watercourse that has a designed reservoir storage capacity for two or more purposes, such as floodwater retardation and irrigation water supply, municipal water supply, and recreation.

### **Scope**

This standard applies to dams that have separate storage allocations for two or more purposes. (Sediment storage is not considered a separate purpose except as indicated under sediment basins (350).)

### **Purpose**

A multiple-purpose dam must provide distinct and specific storage allocations for two or more of the following purposes: (1) floodwater retardation, (2) irrigation, (3) fishing, hunting, boating, swimming, or other recreational uses, (4) improve environment or habitat for fish or wildlife, (5) municipal, (6) industrial, and (7) other uses. (A reservoir for which multiple use is made of the same storage allocation is not a multiple-purpose dam; however, a dam designed for joint-use storage is a multiple-purpose dam.)

### **Conditions where practice applies**

This practice applies only to sites meeting all the following criteria:

1. Topographic, geologic, hydrologic, and soil conditions at the proposed site are satisfactory for constructing a feasible dam and reservoir.
2. The watershed is protected from erosion to the extent that the sediment yield will not shorten the planned effective life of the reservoir.
3. Water is available from a single or combined source of surface runoff base flow or from subsurface storage in sufficient quantity and adequate quality to satisfy the intended purposes.

### **Planning considerations**

#### **Water Quantity**

1. Effects on the water budget, especially of longer downstream flow durations, evaporation from the water surface, and infiltration in the bottom and sides of the pool areas.
2. Effects of water taken from the reservoir for agricultural, industrial, or municipal use.

#### **Water Quality**

1. Effects on the movement of sediments, pathogens, and soluble and sediment-attached substances carried by runoff.
2. Effects of increased downstream bank saturation resulting from longer flow duration on erosion and sediment yield.
3. Potential use of the reservoir for recreation. Factors include increased use of pesticides, human waste, and other pollutants.
4. Effects of sediment pool on temperature and dissolved oxygen on downstream waters.
5. Effects of location of the outlet structure on downstream water temperature and dissolved oxygen.
6. Changes in ground water quality caused by increased infiltration of soluble substances.

### **Design Criteria**

**Foundation, embankment, and spillway.** All dams designed under this standard shall meet or exceed the foundation, embankment, and spillway criteria called for in SCS standard for ponds (378) or in TR-60, as appropriate.

**Floodwater retarding pool and spillway.** Dams having a floodwater retarding purpose shall meet or exceed the requirements of SCS standard for floodwater retarding dams (402).

**Outlet works.** Outlet works discharging releases for several purposes shall have adequate capacity to carry the peak flow resulting from the combined demands at any time. Outlet conduits and appurtenances shall be designed according to criteria that are equal to or better than that called for in SCS standard for ponds (378) or in TR-60, as appropriate.

**Storage.** The usable storage capacity shall be adequate for all purposes. Seasonal variations in demand and the expected losses from seepage and evaporation must be considered.

**Sediment storage.** The capacity, in addition to that required for all other purposes, must offset depletion by sediment accumulation for a period equal to the design life.

**Type of structures.** All dams and appurtenances shall be designed to meet applicable SCS standards for the specific type and class of structure.

#### **Plans and specifications**

Plans and specifications for installing multiple-purpose dams shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

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**DAM, MULTIPLE-PURPOSE, SPECIFICATIONS**

Specifications for dams to which the standard for ponds (378) apply shall, as a minimum, be commensurate with those for ponds (378).

Specifications for dams to which the criteria in TR-60 apply shall be in accord with the guide specifications contained in the National Engineering Handbook, Section 20.